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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.								
10/577,500	02/05/2007	Atul Kuver	65008-065	9932								
<div>7590 09/25/2007 Samuel J. Haidle Pinehurst Office Center, Suite 101 39400 Woodward Avenue Bloomfield Hills, MI 48304-5151</div>			<div>EXAMINER SMITH, CHAD</div> <table border="1"><thead><tr><th>ART UNIT</th><th>PAPER NUMBER</th></tr></thead><tbody><tr><td>2874</td><td></td></tr></tbody></table> <table border="1"><thead><tr><th>MAIL DATE</th><th>DELIVERY MODE</th></tr></thead><tbody><tr><td>09/25/2007</td><td>PAPER</td></tr></tbody></table>		ART UNIT	PAPER NUMBER	2874		MAIL DATE	DELIVERY MODE	09/25/2007	PAPER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/577,500

Applicant(s)

KUIVER ET AL.

Examiner

Chad H. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 10/577,500.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/6/07.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Objections***

1. Claim 8 is objected to because of the following informalities: It is unclear as to which optical waveguide as a first and a second are claimed in claim 1. It will be interpreted as both the first and second waveguides. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

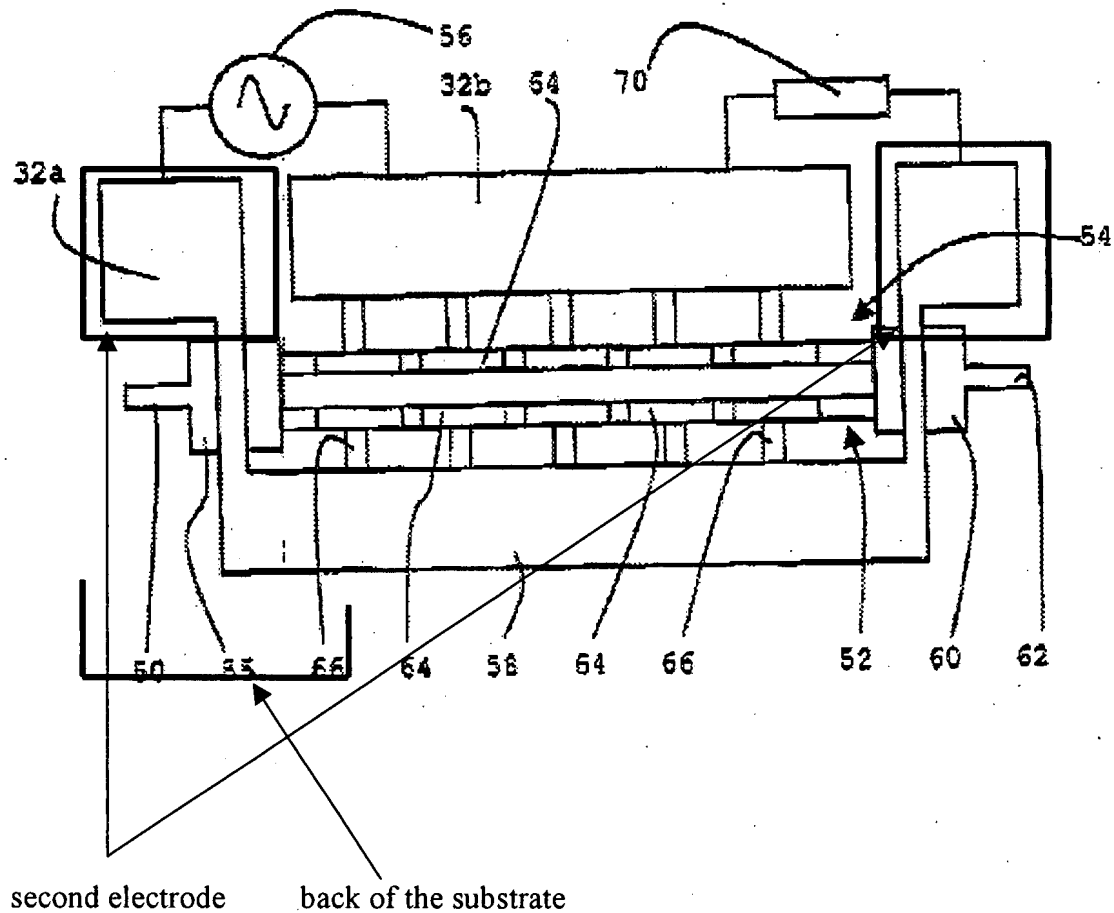
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimber et al. (U.S. PG Pub. # 2003/0118267 A1) in view of Dagli ("Wide-Bandwidth Lasers and Modulators for RF Photonics", IEEE Transactions on Microwave Theory and Techniques, IEEE Inc., Vol. 47, no. 7, July 1999, pages 1151-1171).

3. Kimber et al. teaches a coplanar waveguide line comprising: a substrate (par. 0017); a central electrode strip on the substrate (32b); first (58) and second (refer to fig below) electrode

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strips; first (54) and second (52) optical waveguides on the substrate, the optical waveguides being positioned between the first and central electrode strips and extending parallel thereto (refer to figure below); the central electrode comprising at least one T-rail extending proximate to the first optical waveguide (par. 0048); the first electrode comprising at least one T-rail extending proximate to the second optical waveguide (refer to figure below); the substrate comprising a doped conduction layer (14) extending between the optical waveguides (fig. 1) where the substrate acts as a d.c. electrode for reverse biasing the Schottky diodes; wherein the coplanar waveguide line further comprises an electrical connection between first and second electrode strips (connection in figure below). However, Kimber et al. is silent to first and second electrode strips disposed on opposite sides of the central electrode strip and extending parallel thereto and the substrate comprising an n<sup>+</sup> electrically conducting layer extending between the optical waveguides. It would have been obvious to one of ordinary skill in the art at the time the invention was made to run the second electrode as a thin parallel strip to the first and central electrodes adjacent to the central electrode as doing so would allow for a more compact package shortening the length of the substrate, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. Furthermore, Dagli teaches a modulator using GaAs/AlGaAs with a core composed of GaAs with a n<sup>+</sup> doped layer acting as a ground plane (pg. 1163 col. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the doped conduction layer of Kimber et al. n<sup>+</sup> as doing so allows for low drive voltages.



4. Regarding claim 2, Kimber et al. is silent to wherein the electrical connection between first and second electrode strips is an airbridge. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the connecting strip between the first and second electrode an airbridge (an electrical connection not touching the substrate) so as not to cause an electromagnetic interference with the optical signals at the branching part of the waveguide (55).

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5. Regarding claim 3, Kimber et al. teaches wherein the electrical connection is wire bonded between the first and second electrode strips (figure above).

6. Regarding claim 4, Kimber et al. teaches wherein the electrical connection between first and second electrodes extends through the back of the substrate (figure above).

7. Regarding claim 5, Kimber et al. teaches a plurality of electrical connections between first and second electrode strips, the electrical connections preferably being equally spaced (figure above).

8. Regarding claims 6, 7 and 8, Kimber et al. teaches wherein at least one of the central electrode strip and first electrode strip comprises a plurality of T-rails, comprising contact pads abutting the optical waveguides (par. 0048, and figure above), (64) electrically connected to the corresponding electrode strip by an airbridge (66), preferably equally spaced (figure above).

9. Regarding claim 12, Kimber et al. teaches a Mach-Zehnder modulator including a coplanar waveguide line (par. 0020).

10. Claims 9 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimber et al. (U.S. PG Pub. # 2003/0118267 A1) in view of Dagli (“Wide-Bandwidth Lasers and Modulators for RF Photonics”, IEEE Transactions on Microwave Theory and Techniques, IEEE

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Inc., Vol. 47, no. 7, July 1999, pages 1151-1171) and further in view of Walker et al.

(PCT/GB03/00214) U.S. 7,082,237 will be used as the equivalent.

11. The previous combination teaches a coplanar waveguide line as previously discussed in claim 1 above. However, the previous combination is silent to wherein the substrate comprises a first isolation trench, which extends through the  $n^+$  electrically conducting layer between the first electrode strip and optical waveguides. Walker et al. teaches using trenches to separate the doped region beneath the first rail and the doped region beneath the first waveguide (claim 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the trenches taught in Walker et al. to separate the doped layer of the substrate in Kimber et al. so as to alleviate capacitive loading, which causes impedance and velocity matching to become difficult. Therefore an isolation strip between all the areas where an electrical conducting path lies atop the substrate or a potential difference in voltage atop the substrate and has a capacitive affect with the doped region of the substrate would need to be implemented, accept the desired region of electromagnetic conduction, between the waveguides, so as to alleviate all the capacitive loading as possible, including between the central electrode strip and the optical waveguides and between the central electrode strip and the secondary electrode strip.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad H. Smith whose telephone number is (571) 270-1294. The examiner can normally be reached on Monday-Thursday 7:30a.m. - 5:00p.m. EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-270-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chad H. Smith/  
CHS

/Sung Pak/  
Sung H. Pak  
Primary Examiner  
AU 2874